

Preface: Substantive Revisions Made to this Report Subsequent to 10/21/2016 Release

November 2016 Updates

1. Female mortality rates corrected

The raw mortality rates for females have been revised to correct an error in the conversion from central death rates to mortality probabilities. The error caused the originally published female mortality rates to be lower than the updated, corrected rates. Through the fifth decimal place, there is no change in the rates for ages 49 and below. The difference becomes larger as age increases from 50 to 100. Through age 70, the arithmetic change is less than .0002 and the percentage change in the rates is less than 1%. The updates are more significant at the oldest ages, particularly from ages 90-100.

2. Mortality rates rounded to five decimal places

The original publication had the rates expressed as a floating decimal. The rates have now been rounded to five decimal places to (1) make the values in the cells exactly equal to their visible representations and (2) eliminate the implication of greater precision than was intended.

These changes are reflected in the version of the Excel file currently available on the web site.

The Society of Actuaries (SOA) is pleased to present historical U.S. population mortality rates by gender and single year of age for calendar years 2000-2014.

These crude mortality rates are based on the same data sets underlying the historical probabilities of death [published by the Social Security Administration](#) (SSA). The death counts for ages 0-64 were taken from the National Center for Health Statistics via the “Multiple Cause of Death” data published in the Centers for Disease Control and Prevention (CDC) [WONDER database](#). The population counts for years 2000-2009 are taken from the same source. The 2010-2015 population counts were taken from the Census Bureau’s 2015 Vintage July 1 population estimates.

For ages 65 and up, the SOA requested counts of enrollments and deaths from the Centers for Medicare & Medicaid Services (CMS). The SOA chose to use this data set for the over-65 population because Medicare enrollment requires verification of date of birth, so age information can be more reliable in the CMS data than that for other sources, particularly for the oldest subset of the population.

Use of two different data sets required adjustments to the crude CMS data to ensure it was on the same basis as the CDC data. Because the SSA works closely with these two sources of data, the SOA consulted the SSA regarding the adjustments made to the CMS data for their mortality calculations. The adjustments include:

- A multiplier for deaths at age 65 to reflect that CMS does not capture all age-65 deaths due to enrollment timing
- Estimating July 1 enrollment counts from tabulated January 1 enrollment counts, as the CDC population counts are as of July 1 for a given year.

It is important to remember that these historical mortality rates are crude rates. The SSA uses the same data sources and similar adjustments to compute their historical probabilities of death, but the rates that they calculate are graduated within a given calendar year per the process outlined in [Actuarial Study No. 120](#). No such smoothing was done for this publication.

Finally, it should be noted that the mortality rates calculated for 2014 should be considered preliminary. CMS trues up their most recent year of data in the following year to reflect retroactive enrollments and small data corrections. The SOA studied the pattern of historical changes between preliminary and final enrollment counts and CMS confirmed that our observations were likely to persist in future years. Therefore, the 2014 enrollment counts for ages 65-69 were increased based on the observed historical pattern in anticipation of these counts increasing when final data is made available in 2017.

If you have any questions on these historical U.S. population mortality rates, please contact Patrick Nolan at (847) 273-8860 or pnolan@soa.org.